

Claims

1. An imaging spectrometer comprising;

imaging means for dividing a received image into two or more spatially separated spectral images, and

means for detecting each spectral image,

characterised in that the imaging means comprises at least one polarising beam splitter.
2. A spectrometer according to claim 1 wherein the imaging means comprises image replication means to produce two or more spatially separated images, and one or more filter elements which act to alter the spectral characteristics of one or more of the spatially separated images.
3. A spectrometer according to claim 2 wherein the filter elements are dichroic filter elements.
4. A spectrometer according to claim 2 or 3 wherein the filter elements are located in the vicinity of the means for detecting each spectral image or a conjugate plane thereof.
5. A spectrometer according to any of claims 2 to 4 having image replication means that comprises two or more polarising beam splitters and additionally comprising optical retardation elements located between the polarising beam splitters.
6. A spectrometer according to any of claims 2 to 5 and additionally comprising an input optical retardation element to define the input polarisation state of the image received by the imaging means.

7. A spectrometer according to claim 6 wherein the optical retardation imparted by the input optical retardation element is variable.
8. A spectrometer according to any of claims 5-7 wherein at least one of the optical retardation elements have substantially wavelength independent retardation properties.
9. A spectrometer according to claim 1 wherein the imaging means comprises one or more spectral replication means arranged in optical series, each spectral replication means comprising an optical retardation element and a polarising beam splitter.
10. A spectrometer according to claim 9 wherein one or more of the optical retardation elements provides a wavelength dependent polarisation change.
11. A spectrometer according to claim 9 or 10 wherein the thickness of the one or more optical retardation elements is chosen to define the spectral properties of each spectral image.
12. A spectrometer according to any preceding claim wherein four or more spatially separated spectral images are produced.
13. A spectrometer according to any preceding claim wherein each spectral image is composed of radiation within a different waveband.
14. A spectrometer according to any preceding claim wherein the means for detecting each replicated image comprises a detector array, each replicated image being directed to a separate portion of the detector array.
15. A spectrometer according to any of claims 1-13 wherein the means for detecting each replicated image comprises two or more detector arrays.

16. A spectrometer according to claim 15 wherein a separate detector array is provided to detect each replicated image.

17 A spectrometer according to any preceding claim wherein the polarising beam splitter is a Wollaston prism.

18 A spectrometer according to any preceding claim wherein the optical components of the image replication means are formed as a single compound optical element.

19 A spectrometer according to any preceding claim and additionally comprising a field stop, the field stop limiting the field of view of the image received by the image replication means.